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Harold C. Moore
Name of person mailing Document or Fee

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June 20, 2006
Date of Signature

Re:	Application of:	Ahmed
	Serial No.:	10/672,527
	Filed:	September 26, 2003
	For:	Building Control System Using Integrated MEMS Device
	Group Art Unit:	2125
	Examiner:	Ryan A. Jarrett
	Our Docket No.:	1867-0030
	Siemens Docket No.:	2003P14889US

TRANSMITTAL OF BRIEF ON APPEAL

Please find for filing in connection with the above patent application the following documents:

1. Second Appeal Brief; and

2. One (1) return post card.

In compliance with MPEP 1204.01, we ask that the Commissioner apply the previously paid appeal fee to the Appeal Brief herewith, as no final Board decision has been made on the Appeal filed October 31, 2005. However, please charge any deficiency, or credit any overpayment to Deposit Account No. 13-0014.

Respectfully Submitted,

MAGINOT, MOORE & BECK, LLP

June 20, 2006

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Enclosures

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Sir:

This is an appeal under 37 CFR § 41.31 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the rejection of claims 1, 2, 5-12 and 21-36 of the above-identified patent application. Claims 1, 2, 5-12 and 21-36 have been more than twice rejected. A check in the amount of **$500.00** has been submitted in connection with a previous Appeal Brief filed October 31, 2005. The Examiner withdrew the case from Appeal, and it is requested that the fee filed with the October 31, 2005 Appeal Brief be applied to this Appeal Brief. Also, please provide any extension of time which may be necessary and charge

any fees which may be due to Deposit Account No. 13-0014, but not to include any payment of issue fees.

(1) REAL PARTY IN INTEREST

Siemens Building Technologies, Inc. is the owner of this patent application, and therefore the real party in interest.

(2) RELATED APPEALS AND INTERFERENCES

There is an appeal pending in U.S. Patent Application serial no. 10/353,110, of which this case is a divisional. The Appeal Brief in that application was filed on even date herewith.

(3) STATUS OF CLAIMS

Claims 1, 2, 5-12 and 21-36 are pending in the application.

Claims 1, 2, 5-12 and 21-36 stand rejected and form the subject matter of this appeal. Claims 1, 3, 5-12 and 21-36 are shown in the Appendix attached to this Appeal Brief.

(4) STATUS OF AMENDMENTS

Applicants filed a Response to Office Action dated November 1, 2004 ("First Response") responsive to an Office Action dated June 30, 2004. A second Office Action dated December 28, 2004 was designated by the Examiner to be responsive to the First Response. On March 28, 2005, Applicants filed a Response to Office Action ("Second Response") responsive to the second office action dated December 28, 2004. The Examiner issued a final office action dated May 31, 2005 ("Final Office Action") responsive to the Second Response.

Applicants filed an Appeal Brief on October 31, 2005. Instead of filing an Answer, the Examiner re-opened prosecution and issued a new office action dated January 20, 2006 ("Post Appeal Action").

(5) SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 is directed to an apparatus for use in a building automation system. (See, e.g., system illustrated in Fig. 1). The building automation system includes one or more devices that are operable to generate control outputs based on set point information and process value information from one or more sensors. By way of non-limiting example, the room control module 202 of Fig. 2 is operable to receive set point information and process value from sensors, and is operable to generate control outputs based on this information. (See Fig. 3, which describes the operations of the module 202; Specification at p.21, line 16 to p.25, line 2).

Referring again to the general invention of claim 1, the building automation system further includes one or more actuators operable to perform an operation responsive to at least some of the control outputs. (See, e.g., actuator 262 of module 208 of Fig. 2).

The apparatus according to claim 1 includes at least one microelectromechanical (MEMs) sensor device operable to generate a process value and a processing circuit. (E.g., the module 630, MEMs sensor suite 725, processing circuit 715 of Fig. 7a; Specification at p.37, lines 4-8). The processing circuit is operable convert the process value to an output digital signal that is configured to be communicated to another element of the building automation system. (E.g. processing circuit 715 of Fig. 7a; Specification at p.43, lines 10-16; see also Fig. 7b).

The at least one MEMs sensor device and the processing circuit are integrated onto a first substrate. (E.g., the module 630 of Fig. 7a; Specification at p.32, lines 6-19; Figs. 12a, 12b).

The processing circuit is further operable to generate a first control output based on at least one set point and the process value obtained from the at least one MEMs sensor device. (E.g. steps 760, 765 of Fig. 7b). The output digital signal is representative of the first control output. (E.g. W_{FLO} of Fig. 7b).

Claim 21 is directed to an apparatus for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors. By way of non-limiting example, the building control system of Fig. 1 includes the room control module 202 of Fig. 2. The module 202 is operable to receive set point information and process value from sensors, and is operable to generate control outputs based on this information. (See Fig. 3, which describes the operations of the module 202; Specification at p.21, line 16 to p.25, line 2).

The claimed apparatus includes at least one MEM sensor device, a processing circuit and a battery. (E.g., the module 630, sensor suite 725, processing device 715 of Fig. 7a; battery 1204 of Fig. 12a; Specification at p.32, lines 6-19; Figs. 12a, 12b). The MEMs sensor device is operable to generate a process value (E.g. step 755 of Fig. 7b; Specification at p.39, line 18-22).

The processing circuit is operably connected to the at least one MEMs sensor device to receive the process value therefrom. (E.g. processing circuit 715, sensor suite 725 of Fig. 7a). The processing circuit is operable to convert the process value to an output digital signal configured to be communicated to another element of the building automation system. (E.g. processing circuit 715 of Fig. 7a; Specification at p.43, lines 10-16; see also Fig. 7b). The battery is operably connected to provide power to at least the processing circuit. In the non-limiting example of the disclosed embodiment, Figs. 12a and 12b show a general architecture for

several modules in Figs. 7a, 8a, 9a, 10a and 11a. Thus, the module 630 of Fig. 7a has the general construction shown in Fig. 12a and 12b and thus includes the battery 1204.

Referring again generally to claim 21, the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate, and the battery is secured to the first substrate. (See Figs 12a and 12b).

Claim 26 is directed to an apparatus for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors. By way of non-limiting example, the building control system of Fig. 1 includes the room control module 202 of Fig. 2. The module 202 is operable to receive set point information and process value from sensors, and is operable to generate control outputs based on this information. (See Fig. 3, which describes the operations of the module 202; Specification at p.21, line 16 to p.25, line 2).

Referring again generally to claim 21, the claimed apparatus includes at least one MEM sensor device, a processing circuit and a non-volatile memory. (E.g., the module 630, sensor suite 725, processing device 715, EEPROM 720 of Fig. 7a). The MEMs sensor device is operable to generate a process value. (E.g. step 755 of Fig. 7b; Specification at p.39, line 18-22).

The processing circuit is operably connected to the at least one MEMs sensor device to receive the process value therefrom. (E.g. processing circuit 715, sensor suite 725 of Fig. 7a). The processing circuit is operable to convert the process value to an output digital signal configured to be communicated to another element of the building automation system. (E.g. processing circuit 715 of Fig. 7a; Specification at p.43, lines 10-16; see also Fig. 7b).

The programmable non-volatile memory operably is coupled to the processing circuit and is supported by the first substrate. In the non-limiting example of the disclosed embodiment, Figs. 12a and 12b show a general architecture for several modules in Figs. 7a, 8a, 9a, 10a and 11a. Thus, the module 630 of Fig. 7a has the general construction shown in Fig. 12a and 12b. As shown in Figs. 12a and 12b, the EEPROM 1254 is supported on a first substrate 1202. (See specification at p.33, lines 2-11).

Referring again generally to claim 21, the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate. (See Figs 12a and 12b; Specification at p.33, lines 2-11).

(6) ISSUES

Whether claims 1, 2, 5, 7, 11, 12, 26, 28-30 and 32 are unpatentable under 35 U.S.C. § 102(b) as allegedly being anticipated by PCT International Application Publication WO 00/54237 to Graviton (hereinafter "Graviton").

Whether claims 6, 8-10 and 21-25 are unpatentable under 35 U.S.C. § 103(a) as allegedly being obvious over Graviton in view of U.S. Patent Application Publication No. US2001/0033963 to Yamazaki et al. (hereinafter "Yamazaki").

Whether claims 27, 31, and 33-36 are unpatentable under 35 U.S.C. § 103(a) as allegedly being obvious over Graviton in view of U.S. Patent No. 6,035,240 to Moorehead et al (hereinafter "Moorehead").

(7) ARGUMENT

I. The Anticipation Rejections of Claims 1, 2, 5, 7, 11, 12, 26, 28-30 and 32 are in Error

In the Post Appeal Action, the Examiner rejected claim 1 as allegedly being anticipated by Graviton. As discussed above, claim 1 recites a device having a processing circuit and a MEMs sensor integrated on a first substrate. The processing circuit is operable to generate a first control output based on at least one set point and a process value obtained from the MEMs sensor.

Graviton fails to disclose a device that has an integrated MEMs sensor and a processing circuit, wherein the processing circuit is "operable to generate a first control output based on at least set point and the process value obtained form the at least one MEMs sensor device", as called for in claim 1. While Graviton does teach a sensor assembly 50 having a processing circuit and a MEMs sensor integrated into a single chip, Graviton does not teach that the sensor assembly 50 generates control outputs.

A. The Examiner's Rejection of Claim 1 Should be Reversed

However, the Examiner alleges that the sensor device 50 of Fig. 3 of Graviton *does* generate control values. (Post Appeal Action at pp. 2, 5). In support of this assertion, the Examiner cites a brief statement in Graviton about *an actuator assembly* that states that "actuator commands may be received via the network, e.g., the Internet, from the end user, a node, or another sensor assembly, or may be generated at the actuator assembly such as through a processor". (*Id.* citing Graviton at p.6, lines 19-29). In other words, because the actuator assembly can receive commands from "another sensor assembly", the Examiner assumes that the sensor assembly 50, which is disclosed in another part of the application, must be able to provide

such commands. As will be discussed below, Applicants disagree.

In addition, the Examiner further relies on an inherency argument to establish the anticipation case with respect to claim 1. More specifically, the Examiner alleges that because an actuator command may be received from "another sensor assembly", this other "sensor assembly" must inherently *generate* a control output based *on at least one set point* and a process value from a MEMs sensor. (See Post Appeal Action at p.5)("It is clear that a "set point" is inherently required here"). Applicants also disagree that generation of a control output based on at least one set point is inherently required by Graviton.

1. <u>The Sensor Assembly 50 Does Not Provide Control Values</u>

As an initial matter, Graviton does not disclose a sensor assembly that satisfies all of the elements of claim 1. The sensor assembly of Graviton that the Examiner cites as containing most of the features of claim 1 is the sensor assembly 50 of Graviton, which is disclosed in Fig. 4 of Graviton. (See Post Appeal Action at pp.4-5). While Graviton discloses a large number of embodiments and/or variations of the sensor assembly 50 in pages 15-17, none of those embodiments and/or variations "provides" control values, much less "generates" control values as claimed.

However, to ascribe this capability to the sensor assembly 50, the Examiner relies on a statement regarding a generalized embodiment of an *actuator* assembly provided in the Summary of the Invention portion of Graviton. That statement consists of "actuator commands may be received via the network, e.g., the Internet, from the end user, a node, or another sensor assembly, or may be generated at the actuator assembly such as through a processor". (*Id.* citing Graviton at p.6, lines 19-29). Thus, although the sensor assembly 50 and its different

embodiments are described in detail throughout Graviton, the Examiner relies instead on a statement regarding an unrelated actuator assembly to establish the contention the sensor assembly 50 is operable to provide control output signals.

Applicants disagree. The statement on page 6 of Graviton regarding the actuator assembly does not specifically or generally refer to the sensor assembly 50 described at pages 15-16. None of the multitude of variants or alternatives of the sensor assembly 50 is disclosed as providing a control output. Although it is arguably taught at page 6 of Graviton that at least some sensor somewhere may be able to provide an actuator command, nowhere in Graviton does it teach that a sensor assembly having a MEMs sensor and a processing circuit integrated onto a first substrate can provide an actuator command.

Accordingly, the Examiner has failed to set forth a prima facie case of anticipation with respect to claim 1.

2. <u>Generating a Control Output from a Set Point is Not Inherent</u>

Even if the Examiner's assumption was correct that page 6, lines 9-19 of Graviton are meant to describe additional functionality of the sensor assembly 50 of Fig. 4, such additional functionality does not include generating a control output based *on at least one set point* and a process value from a MEMs sensor, as also recited in claim 1. Nowhere does Graviton disclose *any* sensor assembly that has the capability of generating a control output based on a set point[1] *and* a process value.

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[1] As is known in the control system art, a set point is a variable that represents a desired output of a control system. An example of a set point would be a thermostat temperature setting.

The Examiner appears to admit that Graviton does not expressly teach a sensor device (including a MEMs sensor) that generates a control output based on set point and a sensor value obtained from the MEMs sensor. Instead, the Examiner alleges that the MEMs sensor assembly 50 of Graviton would *inherently* generate a control output based on a sensor value obtained from the MEMs sensor and a set point. (See Post Appeal Action at p.2 and p.5).

The "inherent" disclosure of an element may only be demonstrated if no reasonable alternative to the element could exist. In this case, the Examiner is assuming that because an actuator assembly may receive commands from a "sensor assembly", the sensor assembly must also generate the command based on a sensor value and a set point. The Examiner is mistaken in this assumption.

More specifically, the Examiner's inherency argument first assumes that an actuator may receive actuator commands (i.e. control signals) from a sensor assembly. (*Id.*) If this assumption is correct, then, according to the Examiner, it follows that 1) the sensor assembly must *generate* the control signal, inherently, 2) the sensor assembly must generate the control signal based on a *set point*, inherently, and 3) the sensor assembly must generate the control signal based on a sensed value (i.e. process value) of the MEMs sensor, inherently. These three features must be inherent because none of these features are disclosed in Graviton. To reiterate, Graviton only discloses that the actuator assembly may receive an actuator command from "another sensor assembly", as well as a plurality of other places.

It is submitted that it is possible for the sensor assembly to provide an actuator command (i.e. control signal) to an actuator without all three of above-described inherent operations. Indeed, it is possible for the sensor assembly to provide the actuator command without *any* of those allegedly inherent operations.

As an initial matter, it is possible for a sensor assembly to *provide* an actuator command without *generating* an actuator command. By way of example, a sensor assembly may act as a communication hub or repeater that is capable of receiving commands from another device and passing them on to an actuator. By way of example, the sensor assembly/network interface node 202 of Fig. 2 of the present application is a sensor assembly that is clearly capable of passing a command from one device to another without actually "generating" the actuator command. In such a case, an actuator could receive an actuator command from the sensor assembly 202 of Fig. 2 without the sensor assembly 202 generating the actuator command. Thus, merely *providing* an actuator command does not require *generating* an actuator command.

Moreover, the Examiner is mistaken in believing that actuator commands must be generated based on a set point. An actuator command may be based on user input, by the flipping of a sensor switch (e.g. a limit switch type of operation), expiration of a timer, or by merely detecting the presence of a given characteristic. For example, the mere detection of *any* poisonous gas could cause a device to generate an actuator command to open or close a vent. In such a case, the actuator command is generated without a set point. In another example, an actuator may receive a command to open and close as a testing procedure, or as a function of a time of day. None of these operations require a set point. Thus, any processor may readily generate an actuator command without a set point.

Finally, the Examiner is mistaken in believing that actuator commands must be generated based on a sensor value of a resident sensor. As discussed above, an actuator command may be based on user input, or may be from a sensor value received from another sensor assembly.

Thus, there are various possible scenarios in which the sensor assembly 50 could provide an actuator command without necessarily generating the actuator command using both a set

point and the MEMs sensor value. Moreover, given the uncertain nature of whether the sensor assembly 50 is even capable of *providing* an actuator command, as discussed further above, it is particularly difficult to inherently ascribe all three of the other undisclosed features to the sensor assembly 50.

Thus, because Graviton does not teach an apparatus that has a processing circuit and a MEMs sensor integrated on a substrate, wherein the processing circuit is operable to generate a control output based at least one set point and the process value generated by the MEMs sensor, it is submitted that Graviton does not teach or suggest each and every element of claim 1. For at least this reason, the anticipation rejection of claim 1 over Graviton is in error and should be reversed.

B. Claims 2, 3, 5, 7, 11 and 12

Claims 2, 3, 5, 7, 11 and 12 all stand rejected as anticipated by Graviton. Claims 2, 3, 5, 7, 11 and 12 all depend from and incorporate all of the limitations of claim 1. As discussed above, Graviton fails to teach or suggest a processing circuit that is integrated with a MEMS sensor and which generates a control output based on set point information and sensor values. Accordingly, for at least the same reasons as those discussed above in connection with claim 1, it is respectfully submitted that the rejections of claims 2, 3, 5, 7, 11 and 12 are in error and should be withdrawn.

C. Claims 26, 28-30 and 32

Claims 26, 28-30 and 32 all stand rejected as allegedly being anticipated by Graviton. Claim 26 is similar to claim 1, except that claim 26 includes a limitation directed to a non-

volatile programmable memory supported by the substrate and coupled to the processing circuit. In addition, claim 26 lacks a processor operable to generate a control signal based on a set point and measured value, as claimed in claim 1. For this reasons, the patentability of claims 1 and 26 are argued separately. Claims 28-30 and 32 all depend directly or indirectly from claim 26 and are therefore also argued separately from claim 1.

1. Graviton Does Not Teach Claimed Memory on Substrate

Referring specifically to claim 26, Graviton does not teach a non-volatile programmable memory that is supported by the substrate that includes the processing circuit and the MEMS sensor. Graviton arguably teaches that other types of memories may be incorporated onto such a substrate, but not a non-volatile programmable memory.

In the rejection of claim 26, the Examiner cites Graviton at page 15, line 31 to page 16, line 3 as teaching an EEPROM that is supported on the processing circuit/MEMs substrate. (Post Appeal Action at p.6). The cited passage is reproduced below:

> The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust.

(Graviton at p.15 line 31 to p.16, line 3). There is no mention that the "optional memory" of the processing component may be an EEPROM or other programmable non-volatile memory.

In further discussion of the non-specific embodiment of Fig. 3, Graviton specifically discloses the use of a RAM, ROM or mass storage memory may be "internal" or external to the processor. Thus, assuming the processor is integrated onto the substrate, the RAM, ROM or mass storage could arguably be supported by the substrate. However, RAM and ROM are not programmable non-volatile memory. If mass storage means a hard disk drive or optical disk

drive, then it can hardly be integrated into the microprocessor. Regardless, Graviton specifically fails to disclose or suggest that programmable non-volatile memory may be embedded in the processor on the substrate.

Graviton does discuss, *in an unrelated part of the application*, the possible use of flash memory, but not as a memory integrated on the sensor assembly substrate. In particular, Graviton mentions "flash memory" at pages 4 and 5. These passages are provided below:

> In the preferred embodiment, the sensor assembly containing the digital sensor includes a processor. Such a processor may comprise a microprocessor and associated components including memory (RAM, ROM, mass storage, Flash, optical memory, Biomemory, etc.) and supporting components (e.g. clock bus).

This passage clearly does *not* suggest that the "associated components including memory" would be incorporated onto, or even supported by, the same substrate as that on which both a processing circuit and a MEMS sensor are implemented.

Because Graviton fails to teach a programmable non-volatile memory supported by a substrate that includes both a processing circuit and a MEMS sensor, Graviton fails to teach or suggest all of the limitations of claim 26. For at least this reason, the anticipation rejection of claim 26 over Graviton should be reversed.

Claims 28-30 and 32 depend from and incorporate all of the limitations of claim 26. Accordingly, the rejection of claims 28-30 and 32 over Graviton should be reversed at least the same reasons.

III. <u>The Obviousness Rejections Over Graviton in View of Yamazaki</u>

Claims 6, 8-10 and 21-25 all stand rejected as allegedly being obvious over Graviton in view of Yamazaki.

Claims 6, 8-10 and 21-25 all include, directly or indirectly, a limitation directed to a battery that is *secured to the substrate* in which a MEMS sensor and a processing circuit are integrated. Graviton does not teach an apparatus that includes a processing circuit and a MEMS sensor integrated onto a first substrate, wherein the apparatus further includes a battery secured to the first substrate.

Graviton briefly mentions the existence of a battery. However, the solitary reference to a battery on page 15 at line 21, which indeed does not even positively recite a battery, is insufficient to suggest a battery secured to a substrate. In particular, the solitary reference to a battery on page 15 is set forth below:

> Preferably, the sensors are relatively small (so as not to perturb the environment which they are sensing), inexpensive, low/power sensors prepared preferably, the sensors may operate for one or more days without user intervention, having minimal need for calibration, zeroing, reagent topping, cleaning and/or *battery changing*.

(Graviton at p.15, line 17-21).

A. <u>The Examiner's Obviousness Rejection</u>

The Examiner admitted that Graviton does not teach a battery secured to the substrate that has an integrated MEMs device and processing circuit. (Post Appeal Action at p. 7). The Examiner instead alleged that it "would have been obvious . . . to modify Graviton with Yamazaki et al. since Yamazaki et al. teaches that sheet batteries can be used to reduce the size and thickness of a compact electronic device". The Examiner also alleged that "wiring can be simplified with sheet batteries". (*Id.*)

Even if the above allegations were true, the resulting combination of Graviton and Yamazaki does not arrive at the invention. As will be discussed below in detail, neither Graviton nor Yamazaki teach or suggest securing a battery to an integrated circuit substrate.

In the rejection of claims 6, 8-10 and 21-25, the Examiner alleges that the limitations of MEMs sensor and processing circuit integrated onto a single substrate are met by an embodiment of Graviton wherein the sensor and the processing components are *integrated into a single chip*. As discussed above, the Examiner admits that Graviton does not teach a battery secured to the single chip. Instead, the Examiner relies on Yamazaki as providing that teaching.

Yamazaki, however, does not teach securing a battery to a chip or substrate having integrated elements, but rather to a circuit board. In particular, Fig. 1 shows battery sheets 16, 18 and 20 connected between two substrates 12 and 14. The substrates 12 and 14 are actually circuit boards that hold other electronic parts, such as IC chips 24, 26 and 28. (See Yamazaki at Fig. 2 and ¶[0028]). Thus, Yamazaki fails to teach securing a battery to a chip such as the integrated processor and sensor chip disclosed by Graviton.

Accordingly, one of ordinary skill in the art would not be motivated to secure a battery to a substrate in which a MEMs sensor and a processing circuit are integrated as claimed in claim 26. Yamazaki only teaches securing a battery to an ordinary circuit board, and then securing chips onto the same circuit board. Securing a chip (i.e. substrate) having an integrated MEMs sensor and processing circuit to a second substrate, and then securing a battery to the second substrate, does not constitute securing a battery to the substrate in which a MEMs sensor and a processing circuit have been *integrated*.

Yamazaki provides no guidance or information regarding securing a battery to a substrate having integrated components. Yamazaki certainly does not disclose or suggest securing a battery to a substrate having integrated MEMs components. Yamazaki only describes securing a battery to a circuit board substrate on which various components may be disposed.

Thus, the proposed combination of Graviton and Yamazaki would not arrive at a device in which a battery is secured to a substrate that has integrated MEMs and processing circuitry. For at least this reason, the Examiner has failed to make out a prima facie case of obviousness for claims 6, 8-10 and 21-25.

It is therefore respectfully submitted that the Examiner's obviousness rejections of claims 6, 8-10 and 21-25 are in error and should be reversed.

B. Claims 6 and 8-10 are Also Allowable for Other Reasons

The rejection of claims 6 and 8-10 should be reversed for reasons independent of those set forth above. In particular, claims 6 and 8-10 all depend from and incorporate all of the limitations of claim 1. Accordingly, claims 6 and 8-10 are allowable over Graviton for at least the same reasons as those set forth above in connection with claim 1.

For either or both of the foregoing reasons, the obviousness rejection of claims 6 and 8-10 over Graviton should be reversed.

IV. The Rejection of Claims 27, 31 and 33-36 Over Graviton and Moorehead

Claims 27, 31 and 33-36 depend from and incorporate all of the limitations of claim 26. As discussed above, claim 26 is allowable over the prior art. In addition, the Examiner has not set forth any motivation or suggestion to modify Graviton to arrive at the invention of claim 26 in view of Moorehead. Thus, claims 27, 31 and 33-36 are allowable for at least the same reasons as those set forth above in connection with claim 26.

However, claims 27, 31 and 33-36 are allowable over Graviton and Moorehead for reasons independent of those set forth above in connection with claim 26.

Claims 27, 31 and 35 all contain additional limitations that are not taught or disclosed in Graviton or Moorehead. For example, claim 27 recites that the non-volatile memory is configured to "store information generated by an external device selecting less than all of the available functions of the apparatus to be enabled." Similarly, claims 31 and 35 recite that the EEPROM is configured to store "function enabling information identifying as enabled less than all of the possible sensing functions available to be enabled in the sensor". Claims 33, 34 and 36 depend from one of claims 27 or 33, and therefore include the same respective limitations.

Graviton clearly fails to disclose or suggest any EEPROM or non-volatile memory that stores function selection information. Graviton only teaches that the memory "may be utilized to store sensed data as provided from the sensors . . . and may also be utilized to store program information which achieves the functionality described herein." (Graviton at p.16, lines 27-29). None of these functions suggest that "less than all" of possible functions may been selected, nor that such selection is stored in non-volatile memory. The Examiner admitted this deficiency of Graviton in page 8 of the Post Appeal Action.

However, the Examiner alleged that it would have been obvious to modify Graviton to include such functionality in view of the teachings of Moorehead. As will be discussed below in further detail, Moorehead does not teach an EEPROM that stores information from an external device identifying less than all of the available functions of a sensor device. In this regard, it is submitted that the Examiner has misinterpreted the teachings of Moorehead.

A. <u>Moorehead Does Not Teach Selecting Less Than All Functionality</u>

The Examiner provided the following reasoning in the rejection of claims 27, 31 and 35:

> Moorehead discloses a flexible distributed processing system for sensor data acquisition and control comprising a sensor EEPROM configured to store information generated by an external device selecting less than all of the available sensing function to be enabled on the sensor

> (e.g., col. 5, lines 3-5, col. 5, line 61-col. 6, line 9, col. 6, lines 54-57, col. 7, lines 35-38).
> It would have been obvious. . . to modify Graviton with Moorehead et al. since Moorehead et al. teaches that storing such configuration information on a sensor EEPROM allows the sensor microprocessor to "know" what type of sensor is in use so that the sensor date can be processed accordingly. The sensor of Moorehead et al. is adaptable to measuring a wide variety of parameters with different sensor elements. So it is necessary to store the sensor type among other things in the sensor EEPROM.

(Post Appeal Action at pp.8-9).

Applicants disagree that "Moorehead discloses . . . a sensor EEPROM configured to store information . . . selecting less than all of the available sensing function to be enabled". Moorehead teaches a sensor housing assembly that appears to use an interchangeable and/or modular sensor element. For example, a temperature sensor element may be replaced with a flow sensor element.

As correctly noted by the Examiner, Moorehead also teaches that an identification of the sensor type may be stored in the sensor EEPROM. However, Moorehead never receives or stores information "selecting *less than all* of the *available* sensing functions", as alleged by the Examiner. Moorehead only teaches storing the appropriate sensor type and/or calibration information. There is only one sensor function that is "available" in the Moorehead sensor because there is only one sensor element. As a result, Moorehead would never provide the opportunity to select *less than all* of the available sensor functions, because there is always only one available sensor function.

The single element design is plainly shown in Figs. 3 and 4 of Moorehead and described in the accompanying text in columns 5 and 6 of Moorehead. The sensor module 32 includes a single sensor element 50. Moorehead does not and cannot teach selection of less than all of the available sensor functions of a sensor module.

By contrast, exemplary embodiments of the claimed invention feature devices having multiple sensor elements. Upon installation, one of the sensors is enabled and other available

sensors are not enabled. (Specification at p.10, lines 9-19). This feature of this embodiment of the invention allows a large number of identical sensor modules to be manufactured for use in different sensing functions. For example, instead of manufacturing 100 temperature sensor modules, 100 flow sensor modules, and 100 CO_2 sensor modules, which require three different chip designs and associated manufacturing processes, the claimed invention would enable manufacturing 300 identical modules that have temperature, flow and CO_2 sensors which may be enabled as needed.

Moorehead does not provide multiple sensor elements on a single device, and thus does not provide the above-described advantage. Instead, Moorehead appears to obtain cost benefits by allowing the sensor housing to receive modular sensors (one at a time). This method of cost savings is completely inapplicable to the chip-based sensor module of Graviton, where MEMs sensors cannot be readily replaced.

B. <u>No Motivation to Modify Graviton With Teachings of Moorehead</u>

Moreover, even if the storage of sensor type information as taught by Moorehead did constitute selecting less than all available sensor functions, which it does not, there is no motivation or suggestion to modify the single chip MEMS-based sensor module of Graviton with ability to store sensor type information in an EEPROM. The reason Moorehead teaches storing sensor type information is that the sensor element itself may be physically replaced. It is interchangeable. Thus, it is useful to allow external programming of the electronics to identify the sensor type. By contrast, the MEMs sensor in the single chip module of Graviton *can never be replaced.* The sensor type in Graviton is permanent, and need not programmed into an easily accessible and/or reprogrammable memory such as an EEPROM. Accordingly, the motivation

for storing sensor type information in the Moorehead modular/changeable sensor in an EEPROM is completely absent in the integrated, single chip sensor unit of Graviton.

As a consequence, claims 27, 31 and 35 are patentable over Graviton for multiple reasons that are independent of each other and independent of those discussed above in connection with claim 26. Claims 33, 34 and 36 are patentable for at least the same reasons.

As a result, it is submitted that the obviousness rejection of claims 27, 31 and 33-36 is in error and should be reversed.

(8) CONCLUSION

For all of the foregoing reasons, claims 1, 2, 5, 7, 11, 12, 26, 28-30 and 32 are not unpatentable under 35 U.S.C. § 102(b) and claims 6, 8-10 and 21-25, 27, 31 and 33-36 are not unpatentable under 35 U.S.C. § 103(a). As a consequence, the Board of Appeals is respectfully requested to reverse the rejection of these claims.

Respectfully submitted,

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CLAIM APPENDIX

Claim 1. An apparatus for use in a building automation system, the building automation system including one or more devices that are operable to generate control outputs based on set point information and process value information from one or more sensors, the building automation system further including one or more actuators operable to perform an operation responsive to at least some of the control outputs, the apparatus comprising:

at least one microelectromechanical (MEMs) sensor device operable to generate a process value;

a processing circuit operable convert the process value to an output digital signal configured to be communicated to another element of ~~a~~ the building automation system; and

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate; and

wherein the processing circuit is further operable to generate a first control output based on at least one set point and the process value obtained from the at least one MEMs sensor device, and wherein the output digital signal is representative of the first control output.

Claim 2. The apparatus of claim 1 wherein the processing circuit includes a microelectronics A/D converter, the microelectronics A/D converter operable to receive the process value from the at least one MEMs sensor device and generate a digital sensor signal therefrom.

Claims 3-4 (canceled).

Claim 5. The apparatus of claim 1 wherein the at least one MEMs sensor device includes a plurality of MEMs sensor devices.

Claim 6. The apparatus of claim 1 further comprising a battery secured to the first substrate.

Claim 7. The apparatus of claim 1 wherein the first substrate is a semiconductor substrate.

Claim 8. The apparatus of claim 6 wherein the battery further comprises a lithium ion battery layer.

Claim 9. The apparatus of claim 8 further comprising a power management circuit operably coupled to the lithium ion battery layer.

Claim 10. The apparatus of claim 8 further comprising a second substrate, and wherein the lithium ion battery layer is disposed between the first substrate and the second substrate.

Claim 11. The apparatus of claim 1 further comprising an RF communication circuit operably coupled to the processing circuit.

Claim 12. The apparatus of claim 1 further comprising an EEPROM operably coupled to the processing circuit.

Claims 13-20 (canceled).

Claim 21. An apparatus for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors, the apparatus comprising:

at least one microelectromechanical (MEMs) sensor device operable to generate a process value;

a processing circuit operably connected to the at least one MEMs sensor device to receive the process value therefrom, the processing circuit operable to convert the process value to an output digital signal configured to be communicated to another element of the building automation system;

a battery operably connected to provide power to at least the processing circuit; and

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate, and wherein the battery is secured to the first substrate.

Claim 22. The apparatus of claim 21 wherein the first substrate is a semiconductor substrate.

Claim 27. The apparatus of claim 26, wherein the programmable non-volatile memory comprises an EEPROM configured to store information generated by an external device selecting less than all of the available functions of the apparatus to be enabled.

Claim 28. The apparatus of claim 26, wherein the programmable non-volatile memory is further operable to store configuration information relating to the apparatus.

Claim 29. The apparatus of claim 28, wherein the configuration information includes identification information for the apparatus.

Claim 30. The apparatus of claim 29, wherein the configuration information includes a network address corresponding to the apparatus.

Claim 31. The apparatus of claim 28, wherein the configuration information includes function enabling information, the function enabling information identifying as enabled less than all of the possible sensing functions available to be enabled on the sensor.

Claim 32. The apparatus of claim 28, wherein the configuration information includes system RF communication parameters.

Claim 33. The apparatus of claim 27, wherein the EEPROM is further operable to store configuration information relating to the apparatus.

Claim 34. The apparatus of claim 33, wherein the configuration information includes identification information for the apparatus.

Claim 35. The apparatus of claim 33, wherein the configuration information includes function enabling information, the function enabling information identifying as enabled less than all of the possible sensing functions available to be enabled on the sensor.

Claim 36. The apparatus of claim 27, wherein the EEPROM is integrated on to the first substrate.

EVIDENCE APPENDIX

This section is empty

[NONE]

RELATED PROCEEDINGS APPENDIX

This section is empty

[NONE]